Landscape Representation III: Landform and Ecological Process

Lectures: Wednesdays, Gund Hall 111 (War Room), 11:30 am – 1:00 pm
Labs: Fridays, Gund Hall 518, 10:30-12:30 [TBC]

Instructors:
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Course Description:

Landscape Representation III seeks to examine the fundamental relationship between landform and the dynamic landscape processes it supports and engenders. Through in-depth study of the methods in which these processes are understood, conveyed, and graphically communicated, the course builds upon topics covered in Landscape Representation I and II by focusing on a diverse body of representational models, both past and present, that position landscape architecture as an expanded field involving science, art, architecture, urban design, and philosophy. To accompany precedent study, the course engages in advanced exploration of digital media, with an emphasis on responsive, performative, and indexical methodologies as well as fluid transitions between documentation and speculation, 2D and 3D, static and dynamic, and digital and analog media.

Course topics are organized thematically and range from mapping ecological systems to illustrating time-based processes, from manipulating and extracting topographical datasets to generating intelligent terrain models, from synthesizing geological, ecological, and hydrological processes to depicting the flows, flux, and ephemera of floral and faunal communities. Through simulation, conjecture, and graphic extraction, these physical and temporal landscape processes will be examined at multiple scales, with particular attention paid to the complexities of large-scale sites in order to complement core coursework in the MLA third term.

Weekly lectures and lab exercises will provide the foundation for the group’s collective exploration, research, and discussion. Through a series of working labs, students will be exposed to an expanded set of digital and analog techniques for analyzing and expressing landform and process as a means of advancing both technical and conceptual ability. This format aims to establish fluency in conceptual, organizational, and formal expression as well as to provide a point of departure for an in-depth awareness of landscape precedents and representational techniques.
course STRUCTURE:

The course will be broken into three units that explore the relationships between landform and ecological processes. Lectures and lab sessions will be geared toward developing an understanding of the interrelationships between landform, process, and time, from the geological scale to the human scale. Each Wednesday, topical lectures will be held presenting iconographic precedent drawings and time-based media within the landscape architecture canon as well as from affiliated fields, with examples ranging from film to scientific drawings and from early landscape art to contemporary practice.

Friday classes will be hands-on lab sessions focused on specific representational techniques for complex, large-scale sites, with an emphasis on developing fluid workflows between animation in 3D Studio Max and After Effects, data manipulation and mapping in GIS, modeling in Rhino and Grasshopper, and graphics and layout in the Adobe Suite. The labs are not meant to be prescriptive, rather, each week instructors will present a range of methodologies, which students are expected to expand upon.

Unit 1_Temporal + Composite + Sensory [4 weeks] will examine time as the basis of landscape representation, focusing on the observable and expanding that into the geological, seasonal, and diurnal. With its potential for examining uncertainty and multiple scenarios, time will be framed as a critical driver of landscape and ecology, and emphasis will be placed on both static media (notated, layered drawings) and dynamic media (film, video, animation).

Unit 2_Mapping Flows, Modeling Process [4 weeks] will use time-based media to examine the interrelationship between urban sites and ecological forces and flows. The processes studied will include hydrology, vegetation, occupation patterns, and other flows, networks, and systems, each of which will be viewed with an emphasis on a broad range of physical and temporal scales—from diurnal to seasonal, annual, historical, and geological.

Unit 2_Landform as Embedded Information [4 weeks] will explore the notion of form as embedded information. The cybernetician Gregory Bateson’s description of form as the loading of material with information allows us to explore the many ways in which associative modeling may enrich the design as well as representational concerns of landscape. Lectures and labs will emphasize the capacity for associative modeling to offer designers an approach towards the definition of landforms and the ability to describe and represent the both the processes of their landform formation and the ways in which they may perform.

course REQUIREMENTS:

Assignments:

Students will be expected to complete three interim assignments, corresponding to the three course units, as well as a final project. These assignments work cumulatively to explore the complexities of multiple scales and time periods in landscape, through both abstract and concrete representational techniques, 2D and 3D projection, and static and dynamic media. The assignments are focused on the Boston Waterfront, with Boston Harbor being the center point of a macro-regional site. For each assignment, students should upload requested deliverables to the course iSite by 11:59 pm on the due date, and videos to the course Vimeo channel at https://vimeo.com/channels/804026. More assignment details will be provided at the beginning of each unit.

Assignment 1_Phenomenological Footage [Sensory Stills + 1-2 minute site video] - due Thursday, 10/2
Assignment 2_Regional Process Vignettes [Four 30-second animations] - due Thursday, 10/30
Assignment 3_Associative Modeling [Landform models and performance analysis] - due Tuesday, 11/25

Final Assignment [2 minute video synthesizing Assignments 1, 2 & 3] - due at Final Pinup, 12/15-18 TBD

Final Pinup: At the end of the semester, we will have a formal pinup with instructors and invited jurors. This pinup is scheduled during final exam period (12/15-18, exact date/time TBD), and students are required to participate in person. During this pinup, the final video assignment, which synthesizes the work of the three previous assignments, will be reviewed.

Representation Blog:

To foster discussion on topics of interest and importance to the class, students should upload images to the Representation Blog on Tumblr at http://landscaperepresentation2014.tumblr.com/. Blog entries need not be restricted to built landscape projects, rather, students may draw from a range of contemporary and historic precedents spanning scientific visualization, landscape, architecture, graphic design, infographics, media, blogs, etc. At least two (2) times over the semester, upload images, credits, and a description/thoughts by 11:59 pm Monday before Wednesday’s class.

Grading:

Class Attendance/Participation (including representation blog): 20%
Assignments 1, 2 & 3: 20% each
Final Assignment: 20%
_0.1 week 1 INTRODUCTION
09/03 Lecture – Course Introduction [AH + DM + BC]

Readings:

_1.1 week 2 TEMPORAL + COMPOSITE + SENSORY 1
09/05 Lab – Introduction to Animation: Manipulating Time [BC] ** INTRODUCE ASSIGNMENT 1**
(3D Studio Max + After Effects)
09/10 Lecture – The Animated Landscape: Manipulating Time + Time as Metric [BC]

Readings:

_1.2 week 3 TEMPORAL + COMPOSITE + SENSORY 2
09/12 Lab – Intermediate Animation: Workflows and Media [BC]
(3D Studio Max + After Effects)
09/17 Lecture – Compositing and Notation: Revealing Phenomena [BC]

Readings:
• Palasmaa, Juhani. "Spatial Recall"

_1.3 week 4 TEMPORAL + COMPOSITE + SENSORY 3
09/19 Lab – Composite Workflows: Virtual and Physical Hybrids [BC]
(3D Studio Max + After Effects)
09/24 Lecture – Notation: Revealing Sensory, Textural, and Temporal Information [BC]

Readings:

_1.4 week 5 TEMPORAL + COMPOSITE + SENSORY 4
09/26 Lab – Composite Workflows: Temporal and Static Interactions [BC]
(3D Studio Max + After Effects)
10/01 Lecture – Representational Horizons: Landscape and New Media [BC]

Readings:

_2.1 week 6 MAPPING FLOWS, MODELING PROCESS 1
10/02 ** ASSIGNMENT 1 DUE, INTRODUCE ASSIGNMENT 2**
10/03 Lab – Simulating and Modeling Hydrology, Streamlines and Fluid Dynamics [AH]
(Aquaveo, 3dsmax particle systems, Rhino)

Readings:

_2.2 week 7 MAPPING FLOWS, MODELING PROCESS 2
10/10 Lab – Illustrating Dynamic Plant Communities [AH]
(ArcGIS, Rhino, Grasshopper, Illustrator)
10/15 Lecture – Biotic Flows: Vegetal Networks [AH]
Readings:


_2.3_ week 8 MAPPING FLOWS, MODELING PROCESS 3
10/22 Lecture – Occupational Flows: Connectivity, Infrastructure, and Altered Landscapes [AH]

Readings:


10/21 Studio 1211 Module 3 Review

_2.4_ week 9 MAPPING FLOWS, MODELING PROCESS 4
10/24 Lab: Synthesizing Composite Processes [AH] (Rhino, Grasshopper, ArcGIS, Ecotect, Illustrator)

Readings:


10/30 ** ASSIGNMENT 2 DUE, INTRODUCE ASSIGNMENT 3**
10/31 Lab: An introduction to the use of geometry and modeling as a generative tool (DM) (Rhino, Grasshopper)
11/05 Lecture – The generative role of drawing and notation within the design process [DM]

Readings:


11/04 Studio 1211 Module 4 Review

_3.1_ week 10 (LAND)FORM AS EMBEDDED INFORMATION 1 - DRAWING, MODELING, NOTATION AND THE DESIGN PROCESS
10/30 ** ASSIGNMENT 2 DUE, INTRODUCE ASSIGNMENT 3**
11/05 Lecture – The generative role of drawing and notation within the design process [DM]

Readings:


11/04 Studio 1211 Module 4 Review

_3.2_ week 11 (LAND)FORM AS EMBEDDED INFORMATION 2 - GEO-MORPHOGENESIS
11/07 Lab – An introduction to associative geometry and its application in the construction of landform models. – Associative morphologies. [DM] (Rhino, Grasshopper)
11/12 Lecture – Representing landform types, their morphologies and the processes that shape them. Approaches towards modeling constructed and natural landforms [DM]

Readings:

- Petschek, P. (2008), Grading for Landscape Architects and Architects, Basel, Boston, Berlin, Birkhauser

_3.3_ week 12 (LAND)FORM AS EMBEDDED INFORMATION 3 – EMBEDDED PERFORMANCE

11/14 Lab – An introduction to associative geometry and its application in the construction of landform models – Diagramming and integrating performance [DM]
(Rhino, Grasshopper)

11/19 Lecture – Modeling and diagrammatic techniques for describing and embedding performance within landscapes [DM]

Readings:

11/18 Studio 1211 Phase 5 Review

_3.4_ week 13 (LAND)FORM AS EMBEDDED INFORMATION 4 – COLONIZATION

11/21 Lab – An introduction to associative geometry and its application in the construction of landform models. – Diagramming and integrating performance, cont’d [DM]
(Rhino, Grasshopper)

11/25 ** ASSIGNMENT 3 DUE**

11/27-12/1 Thanksgiving Recess – no classes

12/03 Lecture – Landform and the representation of its organizational, social and political effects [DM]

Readings:

12/08-12 Studio 1211 Final Review (TBD)

12/15-18 FINAL ASSIGNMENT DUE (GSD2241 FINAL PINUP, DATE TBC)
Computing Requirements:

We will be using several software platforms and covering a number of digital representation topics in the weekly labs. In order to cover all course material, it is critical that you have your personal computer configured to the below requirements by the time class meets on Friday, September 6th, as labs will require you to bring your personal laptop to each class (no laptops in Wednesday lectures). Students are responsible for installing and purchasing software on their own. Generally, with the exception of the Adobe Creative Suite and Adobe After Effects (which are installed on lab machines), the software we will be using in the course is available either on the GSD Software server (goliath.design.harvard.edu\Software) or is free online. For installation instructions, please refer to the GSD Readme files on Goliath or the software download instructions on product websites listed below.

- **Computer and OS requirements:**
  - Laptop computer [PC, or Mac capable of running Windows] with at least 2GB ram [4GB+ preferred]
  - Windows XP or later
  - Mouse [ArcGIS and Rhino are severely hindered without an external mouse with scroll wheel]

- **Software: graphics and layout:**
  - Adobe Acrobat Pro [or equivalent PDF printer such as CutePDF]

- **Software: Rhino and plugins:**
  - RhinoCeros 5 [available on goliath.design.harvard.edu\Software\Rhino]
    1. You MUST make sure to have the latest service releases installed, or RhinoTerrain and Grasshopper will not run.
    2. Rhino 5 does not run on wireless unless you have VPN access. To work around this issue, you must start Rhino BEFORE CLASS while connected to a wall jack. It will continue to run when you disconnect your Ethernet cable.

    - **RhinoTerrain** [available on Goliath but only works on GSD-licensed versions of Rhino, 15-day free trial available from http://www.rhinoterrain.com/]
    - **Grasshopper:** generative/parametric process-driven modeler for Rhino [available for free from www.grasshopper3d.com/]
    - **Kangaroo:** a Live Physics engine for interactive simulation, optimization and form-finding directly within Grasshopper [available for free at http://www.food4rhino.com/project/kangaroo]. Installation Instructions: In Grasshopper, choose File > Special Folders > Components folder. Save the gha file there. Right-click the file > Properties > make sure that it is not ‘blocked’ Restart Rhino and Grasshopper
    - **Autodesk Ecotect:** evaluative environmental performance software. [available at goliath.design.harvard.edu\Software\Ecotect 2011]

- **Software: animation:**
  - Adobe After Effects Note: Adobe CC Standard does not include Adobe AfterEffects, but a 30-day free trial is available at adobe.com
  - Autodesk 3D Studio Max [available on goliath.design.harvard.edu\Software\3D StudioMax 32-bit or 64-bit]

- **Software: GIS, mapping, and data extraction:**
  - ArcGIS 10.2 [available on goliath.design.harvard.edu\Software\ArcGIS]
  - Google Earth [available for free at http://www.google.com/earth/download/ge/]
  - Google Sketchup Pro [available on goliath.design.harvard.edu\Software\Sketchup]

- **Other programs (OPTIONAL, covered in advanced demos):**
  - Paneling Tools: A Rhino plugin that panelizes and creates geometric patterns on NURBS surfaces [available for free from http://wiki.mcneel.com/labs/panelingtools]
  - PointSet Reconstruction: A free Rhino plugin that performs similarly to RhinoTerrain [available for free from http://wiki.mcneel.com/labs/pointsreconstruction]
  - SectionTools: A Rhino plugin that creates intelligent, dynamic sections. [available for free from http://wiki.mcneel.com/labs/sectiontools]
  - For more Rhino tools and plugins, see [http://www.rhino3d.com/resources/] or [www.food4rhino.com]
course REFERENCES:

_representation: graphic techniques

_representation: theory

_representation: diagramming, mapping, and displaying information
Visualizing Systems (www.visualizingsystems.com)
**precedents and compilations**


**visualizing ecological process**


**digital design and fabrication**


